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EXAMINER	
VORTMAN, ANATOLY	
ART UNIT	PAPER NUMBER
2835	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/792,101	XUE ET AL.	
	Examiner	Art Unit	
	Anatoly Vortman	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14-16 and 21-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-16 and 21-30* is/are rejected.

7)☒ Claim(s) *31-35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Reply Under 37 CFR 1.111

1. The submission of the reply filed on 11/13/06 to the non-final Office action of 08/09/06 is hereby acknowledged. No claims were amended. New claims 32-35 have been added. Thus, claims 1-12 and 14-16, and 21-35 are pending in the instant application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 5, 14, 16, 25 and 26 are rejected under 35 U.S.C. 102(a) as being anticipated by Oggioni et al.

Regarding claim 5, Oggioni et al. discloses a circuit board component, comprising: a substrate having non-conductive material and conductive material supported by the non-conductive material (paragraph 0033, 0035), the conductive material defining (i) a circuit board interface, (ii) a die interface, (iii) a heat spreader interface, and (iv) a set of connections which interconnects the circuit board interface, the die interface and the heat spreader interface, a die coupled to the die interface defined by the conductive material of the substrate (paragraph 0021

and 0022 describe the interconnections between the die, the heat spreader and circuit board interface, since they are electrically connected, the conductive material of the substrate is exposed at the interface, and therefore, defines the interface), the die including integrated circuitry which is configured to electrically communicate with a circuit board when the circuit board couples to the circuit board interface defined by the conductive material of the substrate (paragraphs 0021, 0035), and a heat spreader coupled to the heat spreader interface defined by the conductive material of the substrate, the heat spreader being configured to dissipate heat from the die (paragraph 0004), the heat spreader in combination with the heat spreader interface forming an electromagnetic interference shield when a portion of the circuit board interface connects to a ground reference of the circuit board through the circuit board interface (paragraphs 0009, 0010., figure 3), wherein the die is disposed between the heat spreader and the substrate (fig. 3, 4) and wherein the circuit board component is an Application Specific Integrated Circuit (paragraphs 0015, 0016).

.Regarding claim 14, Oggioni et al. discloses a circuit board component, comprising: a heat spreader configured to dissipate heat from the circuit board component (paragraph 0004), a substrate having non-conductive material and conductive material supported by the non-conductive material (paragraph 0033), the conductive material defining (i) a circuit board interface, (ii) a die interface, (iii) heat spreader connecting means (201) for physically and electrically connecting to the heat spreader, and (iv) a set of connections which interconnects the circuit board interface, the die interface and the heat spreader connecting means (paragraphs 0021, 0022, 0035), wherein the heat spreader and the heat spreader connecting means form an electromagnetic interference shield when a portion of the circuit board interface connects to a

ground reference of a circuit board through the circuit board interface (paragraphs 0009, 0010., figure 3), and a die coupled to the die interface defined by the conductive material of the substrate (paragraph 0035), the die including integrated circuitry which is configured to electrically communicate with the circuit board when the circuit board couples to the circuit board interface defined by the conductive material of the substrate (paragraph 0021), wherein the die is disposed between the heat spreader and the substrate (fig. 3, 4) and wherein the circuit board component is an Application Specific Integrated Circuit (paragraphs 0015, 0016).

Regarding claim 16, Oggioni et al. further discloses a heat spreader interface defined by the conductive material of the substrate which includes: conductive ground plates disposed along a flat surface of the substrate, the conductive ground plates encircling the die interface in a 360 degree manner (top surface of PTH's '201' in figure 2 & 3 that contact the heat spreader '401' constitute the conductive ground plane) to minimize escape of electromagnetic interference from the die during operation of the integrated circuitry (Oggioni et al., paragraph 0009).

Regarding claim 25, Oggioni et al. further disclose that the conductive ground plates that are disposed along the flat surface of the substrate define a separation distance between adjacent ground plates (see figure 2).

Regarding claim 26, Ogionni et al. further disclose that the separation distance is less than one-half the length of an electromagnetic wave (although Ogionni et al. does not disclose the distance between the adjacent ground plates, this distance will have to be less than one-half of some electromagnetic wave since electromagnetic waves can exist in any wavelength, see attached description of the Electromagnetic waves from The Hutchinson Encyclopedia, Helicon Publishing Limited, 2001).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 6-8,10-12, 15, 21-24, and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oggioni et al. (PGPub US 2003/0174478) in view of Takeuchi (PGPub US 2003/0122242 A1).

Regarding claims 1 and 29, Oggioni et al. discloses a circuit board module, comprising: a circuit board having a component mounting location, a circuit board component mounted to the component mounting location of the circuit board (Figure 3), the circuit board component including: a substrate having non-conductive material layer and conductive material layer supported by the non-conductive material (paragraph 0033), the conductive material defining (i) a circuit board interface, (ii) a die interface, (iii) a heat spreader interface, and (iv) a set of connections which interconnects the circuit board interface, the die interface and the heat spreader interface, a die coupled to the die interface defined by the conductive material of the substrate (paragraph 0035), the die including integrated circuitry which is configured to electrically communicate with the circuit board when the circuit board couples to the circuit board interface defined by the conductive material of the substrate (paragraph 0021, 0035), and a heat spreader coupled to the heat spreader interface defined by the conductive material of the substrate, the heat spreader being configured to dissipate heat from the die (paragraph 0004), the

heat spreader in combination with the heat spreader interface forming an electromagnetic interference shield when a portion of the circuit board interface connects to a ground reference of the circuit board through the circuit board interface (paragraphs 0009, 0010, figure 3). Oggioni et al. do not disclose a heat sink in thermal communication with the heat spreader. Takeuchi discloses a heat sink in thermal communication with the heat spreader of a circuit board module (Figure 6). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the heat sink in contact with the heat spreader as taught by Takeuchi in the circuit board module as disclosed by Oggioni et al. in order to improve thermal dissipation (Takeuchi, paragraph 0023), wherein the die is disposed between the heat spreader and the substrate (fig. 3, 4) and wherein the circuit board component is an Application Specific Integrated Circuit (paragraphs 0015, 0016).

Regarding claim 2, Oggioni et al. further discloses a heat spreader interface defined by the conductive material of the substrate of the circuit board component which includes a conductive ground plane disposed along a flat surface of the substrate (Top surface of PTH's '201' in figure 2 & 3 that contacts the heat spreader '401' constitute the conductive ground plane) which minimizes the escape of electromagnetic interference from the die during operation of the integrated circuitry (paragraph 0010). Oggioni et al. do not disclose that the conductive ground plane completely encircles the die interface in a 360 degree manner. Takeuchi discloses a ground plane that completely encircles the die in a 360 degree manner (paragraph 0027). At the time the invention was made, it would have been obvious to one of ordinary skill in the ad to incorporate the ground plane that completely encloses the die in a 360 degree manner as taught by Takeuchi

in the circuit module as disclosed by Oggioni et al., in order to create a complete EMI shield around the die (Oggioni et al., paragraph 0009).

Regarding claim 3, Oggioni et al. further discloses a circuit board module of claim 1 wherein the heat spreader interface defined by the conductive material of the substrate of the circuit board component includes: conductive ground plates disposed along a flat surface of the substrate, the conductive ground plates encircling the die interface in a 360 degree manner (Top surface of PTH's '201' in figure 2 &. 3 that contacts the heat spreader '401' constitute the conductive ground plane) to minimize escape of electromagnetic interference from tie die during operation of the integrated circuitry (Oggioni et al., paragraph 0009).

Regarding claim 4, Oggioni et al discloses a circuit board module, comprising: a circuit board having a component mounting location (Figure 3), a circuit board component mounted to the component mounting location of the circuit board, the circuit board component including: a heat spreader configured to dissipate heat from the circuit board component (paragraph 0004), a substrate having non- conductive material and conductive material supported by the non-conductive material (paragraph 0033), the conductive material defining (i) a circuit board interface, (ii) a die interface, (iii) heat spreader connecting means (201) for physically and electrically connecting to the heat spreader (paragraph 0033), and (iv) a set of connections which interconnects the circuit board interface, the die interface and the heat spreader connecting means (paragraphs 0021 & 0022), wherein the heat spreader and the heat spreader connecting means form an electromagnetic interference shield when a portion of the circuit board interface connects to a ground reference of the circuit board through the circuit board interface (figure 3, paragraph 0009), and a die coupled to the die interface defined by the conductive material of the

substrate, the die including integrated circuitry which is configured to electrically communicate with the circuit board when the circuit board couples to the circuit board interface (paragraph 0021) defined by the conductive material of the substrate. Oggioni et al. do not disclose a heat sink in thermal communication with the heat spreader. Takeuchi discloses a heat sink in thermal communication with the hear spreader of a circuit board module (Figure 6). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the heat sink in contact with the heat spreader as taught by Takeuchi in the circuit board module as disclosed by Oggioni et al. to improve thermal dissipation (Takeuchi, paragraph 0023), wherein the die is disposed between the heat spreader and the substrate (fig. 3, 4) and wherein the circuit board component is an Application Specific Integrated Circuit (paragraphs 0015, 0016).

Regarding claim 6, Oggioni et al. satisfy all the limitations of claim 5, and further discloses a heat spreader interface that includes a conductive ground plane disposed along a flat surface of the substrate (top surface of PTH's '201' in figure 2 & 3 that contact the heat spreader '401' constitute the conductive ground plane) which minimizes the escape of electromagnetic interference from the die during operation of the integrated circuitry (paragraph 0010). Oggioni et al. do not disclose that the conductive ground plane completely encircles the die interface in a 360 degree manner. Takeuchi discloses a ground plane that completely encircles the die in a 360 degree manner (paragraph 0027). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the ground plane that completely encloses the die in a 360 degree manner as taught by Takeuchi in the circuit module as disclosed

by Oggioni et al., in order to create a complete EMI shield around the die (Oggioni et al., paragraph 0009).

Regarding claim 7, Oggioni et al. as modified by Takeuchi discloses all the limitations of claim 6, and further disclose that the conductive ground plane of the heat spreader extends along an outer periphery of the substrate (figure 4). Oggioni et al. do not disclose a conductive ground edge disposed along the outer periphery of the substrate, the conductive ground edge being contiguous with the conductive ground plane and extending from the conductive ground plane in a substantially perpendicular manner relative to the conductive ground plane to minimize escape of electromagnetic interference from the substrate during operation of the integrated circuitry. Takeuchi et al. discloses a conductive ground edge disposed along the outer periphery of the substrate, the conductive ground edge being contiguous with the conductive ground plane and extending from the conductive ground plane in a substantially perpendicular manner relative to the conductive ground plane (figures 3 & 4) to 'minimize escape of electromagnetic interference from the substrate during operation of the integrated circuitry (paragraph 0004). At the time the invention was made, it would have been obvious for one of ordinary skill in art to incorporate the conductive ground edge disposed along the outer periphery of the substrate with the conductive ground edge contiguous with the conductive ground plane and extending from it in a substantially perpendicular manner, as taught by Takeuchi in the circuit board component of Oggioni et al. in order to be able to incorporate more electrical components under heat spreader and to provide EMI protection for them (Takeuchi, figure 7, paragraph 0025, 0026).

Regarding claim 8, Oggioni et al. further discloses that the heat spreader includes a main portion which extends along the flat surface of the substrate in a substantially parallel manner

relative to the flat surface of the substrate, and an edge portion which extends along the outer periphery of the substrate in a substantially parallel manner relative to the outer periphery of the substrate, where the edge portion is contiguous with the main portion. Oggioni et al. do not disclose that the edge portion extends from the main portion in a substantially perpendicular manner relative to the main portion. Takeuchi et al. disclose a heat spreader where the edge portion extends from the main portion in a substantially perpendicular manner relative to the main portion. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the heat spreader where the edge portion extends from the main portion in a substantially perpendicular manner relative to the main portion, as taught by Takeuchi in the circuit board component of Oggioni et al. in order to create a complete EMI fence around the die (Oggioni et al., paragraph 0009).

Regarding claim 10, Oggioni et al. as modified by Takeuchi satisfies all the limitations of claim 5, and further disclose that the heat spreader interface includes: conductive ground plates disposed along a flat surface of the substrate, the conductive ground plates encircling the die interface in a 360 degree manner (top surface of PTH's '201' in figure 2 & 3 that contacts the heat spreader '401' constitute the conductive ground plane) to minimize escape of electromagnetic interference from the die during operation of the integrated circuitry (paragraph 0010).

Regarding claim 11, Oggioni et al. do not disclose a ring shaped solder joint formed from high temperature solder which forms an electromagnetic interference seal between the heat spreader and the heat spreader interface defined by the conductive material of the substrate. Takeuchi discloses a ring shaped solder joint ('408', paragraph 0019) formed from high

temperature solder which forms an electromagnetic interference seal between the heat spreader and the heat spreader interface defined by the conductive material of the substrate (paragraph 0004, 0015).

Regarding claim 12, Oggioni et al. further that discloses the heat spreader interface is disposed along a first flat surface of the substrate (figure 4), wherein the circuit board interface is disposed along a second flat surface of the substrate (figure 2 & 4), wherein the first and second flat surfaces are substantially parallel to each other, wherein the circuit board interface includes an array of pads, and wherein the circuit board component further comprises: an array of circuit board contacts coupled to the array of pads, the array of circuit board contacts being configured to mount to an area array component mounting location of the circuit board using a surface mount technology soldering process (paragraph 0009, 0035).

Regarding claim 15, Oggioni et al. discloses all the limitations of claim 14, and further discloses a heat spreader interface defined by the conductive material of the substrate which includes a conductive ground plane disposed along a flat surface of the substrate (Top surface of PTH's '201' in figure 2 & 3 that contacts the heat spreader '401' constitute the conductive ground plane) which minimizes the escape of electromagnetic interference from the die during operation of the integrated circuitry (paragraph 0010). Oggioni et al. does not disclose that the conductive ground plane completely encircles the die interface in a 360 degree manner. Takeuchi discloses a ground plane that completely encircles the die in a 360 degree manner (paragraph 0027). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the ground plane that completely encloses the die in a 360 degree manner

as taught by Takeuchi in-the circuit module of Oggioni et al., in order to create a complete EMI shield around the die (Oggioni et al., paragraph 0009).

Regarding claims 21, 23 and 27, Oggioni et al. as modified by Takeuchi discloses all the limitations of claims 3, 10 and 4, respectively. Oggioni et al. further disclose that the conductive ground plates that are disposed along the flat surface of the substrate define a separation distance between adjacent ground plates (see figure 2).

Regarding claims 22, 24 and 28, Ogionni et al. further disclose that the separation distance is less than one-half the length of an electromagnetic wave (although Ogionni et al. does not disclose the distance between the adjacent ground plates, this distance will have to be less than one-half of some electromagnetic wave since electromagnetic waves can exist in any wavelength, see attached description of Electromagnetic waves from The Hutchinson Encyclopedia, from Helicon Publishing Limited, 2001.)

Regarding claim 30, Oggioni et al. further disclose (Fig. 3), that the heat spreader comprises: a primary portion (305) extending along the flat surface of the substrate in a substantially parallel manner relative to the flat surface of the substrate; and a secondary portion (201) extending from the primary portion toward the substrate along a direction substantially perpendicular to the flat surface of the substrate, the secondary portion (201) electrically contacting (via solder balls (203)) the conductive ground plane disposed along a flat surface of the substrate.

6. Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Oggioni et al. in view of Takeuchi as applied to claim 8 above, and further in view of Lee at al. (PGPub US 2004/0150102 A1).

Oggioni as modified by Takeuchi satisfies all the limitations of claim 8, and further disclose electrically conductive material which forms an electromagnetic interference seal between the main portion of the heat spreader and the conductive ground plane of the heat spreader interface. However, Oggioni et al does not disclose electrically conductive material between the edge portion of the heat spreader and the conductive ground edge of the heat spreader interface. Lee et al. discloses electrically conductive material, which forms an electromagnetic interference seal between the edge portion of the heat spreader and the conductive ground edge of the heat spreader interface (figure 5, paragraph 0029). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the electrically conductive material between the edge portion of the heat spreader and the conductive ground edge of the heat spreader interface, as taught by Lee et al., in the circuit board component disclosed by Oggioni et al. in order to create a complete EMI shield around the die (Oggioni et al., paragraph 0009). Further, regarding claim 29, the claim was meant to be grouped with claim 1, since Oggioni anticipates the claimed subject matter as presented in the body of the rejection.

Allowable Subject Matter

7. Claims 31-35, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including **all of the limitations of the base claim and any intervening claims**.

The following is a statement of reasons for the indication of allowable subject matter: claims 31-35, each recites the limitations, which have not been taught by the art of record: "a conductive ground edge extending from the secondary portion along a direction substantially perpendicular to the flat surface of the substrate and overhanging an outer periphery of the substrate, the conductive ground edge electrically coupled to a conductive ground edge portion of the heat spreader interface that extends along the outer periphery of the substrate".

Response to Arguments

8. Applicant's arguments have been fully considered but they are not persuasive. Applicant contends: "Oggioni does not teach or suggest a die disposed between a heat spreader and a substrate". On the contrary, Fig. 3 of Oggioni shows a die (301) disposed between a heat spreader (305) and a substrate (main board) having a non-conductive material (lower portion of the board) and a conductive material (upper portion of the board and solder balls) supported by the non-conductive material, the conductive material defining: a circuit board interface, a die interface, a heat spreader interface and a set of connections (paragraph 0021 and 0022 describe the interconnections between the die, the heat spreader and circuit board interface, since they are electrically connected, the conductive material of the substrate is exposed at the interface, and therefore, defines the interface). Further, regarding the 35USC 103 rejection of claims 1 and 4, the gist of the Applicant's arguments is that "there is no motivation to combine Oggioni and

Takeuchi", because, allegedly "the modification of the package of package [sic] of Oggioni would render the package unsatisfactory for its intended purpose". This is not found persuasive as well. As decided in *In re O'Farrel*, 7 USPQ 2d, 1673-1681, Fed. Cir. 1988, obviousness does not require absolute predictability of success. Indeed, for many inventions that seem quite obvious, there is no absolute predictability of success until the invention is reduced to practice. There is always at least a possibility of unexpected results, that would then provide an objective basis for showing that the invention, although apparently obvious, was in law nonobvious. *In re Merck & Co.*, 800 F.2d at 1098, 231 USPQ at 380; *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1461, 221 USPQ 481, 488 (Fed. Cir. 1984); *In re Papesch*, 315 F.2d 381, 386-387, 137 USPQ 43, 47-48 (CCPA 1963). For obviousness under 35 U.S.C. 103, all that is required is a reasonable expectation of success. *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651-652 (Fed. Cir. 1985); *In re Clinton*, 527 F.2d 1226, 1228, 188 USPQ 365, 367 (CCPA 1976). In this case, the idea of supplementing the Oggioni structure with a heat sink (i.e. teaching of Takeuchi) would definitely motivate an artisan in the cooling art at the time of the invention to reasonably expect a success of the modification, since the heat sink would enhance the heat dissipation. Further, the modification would not necessarily defeat the purpose of the Oggioni invention (i.e. miniaturization) by unsatisfactory increasing the size of the device, since the heat sink may be designed having small dimensions in accordance with the miniaturization standards. Further, the test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA) 1969. In

this case, the simple and straightforward idea of using a heat sink taught by Takeuchi for augmenting the rate of the heat exchange, taken as a whole, would, definitely, have suggested to a person of ordinary skill in the cooling art at the time of the invention, to use the heat sink in conjunction with the device of Oggioni in order to enhance the thermal dissipation.

Therefore, the rejection is believed to be appropriate and is hereby maintained.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anatoly Vortman, P.E.
Primary Examiner
Art Unit 2835

AV